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## NORWEGIAN SEISMIC ARRAY

# NORSAR

ROYAL NORWEGIAN COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH (NTNF)  
POST ADDRESS NTNF/NORSAR P.O.BOX 51 N-2007 KJELLER, NORWAY

R & D STATUS REPORT FOR PROJECT "DEVELOPMENT AND EVALUATION OF A  
REGIONAL SEISMIC ARRAY IN NORWAY - ACQUISITION OF AUTOMATIC DATA  
PROCESSING EQUIPMENT" - APRIL - JUNE 1985

ARPA ORDER	:	4950
Program Code	:	5A10
Name of Contractor	:	Royal Norwegian Council for Scientific and Industrial Research
Effective Date of Contract	:	1 December 1984
Contract Expiration Date	:	30 November 1985
Amount of Contract Dollars	:	825.301
Contract Number	:	F49620-85-C-0016
Principal Investigator and Phone Number	:	Dr. Frode Ringdal Norway: (02) 71 69 15
Program Manager and Phone Number	:	Dr. Henry Radoski (202) 767-4904
Short title of work	:	Development and evaluation of a regional seismic array in Norway

### 1. Progress

Approved for public release;  
distribution unlimited.

The NORESS field installations were visited during June 4 - June 27 by three representatives of Sandia. During this period, several modifications and improvements were implemented. Shielding of cables, modifications to the hub processor and alteration of the power supply system has contributed to increased system reliability. These changes have led to a reduced error rate, and the data from NORESS are presently without errors.

The performance of the NORESS Earth station for transmission of seismic data to the US has been very good during the reporting period. The new oscillator installed by COMSAT General in March is very stable in frequency, and there has been no need for frequency adjustments after this installation. A few outages during June were due to thunderstorms that caused power breaks in the array area.

RESEARCH (AFSC)

The 64 kbits/s land line from the array to NORSAR's data processing center at Kjeller has had the following uptimes: April 82%, May 88% and June 84%. This represents a decay in performance relative to the preceding 3-months period. The main reason for the long outage periods is again the lack of repair services by NTA during weekends, and we have once more approached NTA on this subject. Their answer is that improved services outside office hours will be the subject of forthcoming negotiations between NTA and NTA's employees. During June, thunderstorms in the array area caused power failure in transmission equipment located in the central NORESS station.

The work at the data center during the reporting period concentrated on further software developments for the real time data processing and status monitoring systems. All NORESS data have been processed in real time throughout the reporting period, and from May 19, a first version of a bulletin with the processing results has been transmitted daily (Monday to Friday) to the Center for Seismic Studies in Rosslyn, Virginia via the ARPANET. Work on improving the bulletin continues.

2. Major items of equipment purchased

None

3. Change in key personnel

None

4. Information derived from meetings, visits, etc.

During May 1-9 representatives of Sandia and NORSAR met in Albuquerque to discuss the status of the NORESS array and plans for further work. From NORSAR, Frode Ringdal, Rune Paulsen, Paul Larsen and Svein Mykkeltveit participated in the meetings.

The NORESS array was officially opened in Oslo on June 3. The opening ceremonies commenced at the Ministry of Foreign Affairs in Oslo with statements by representatives of Norwegian and U.S. authorities and also by U.S. President Ronald Reagan, who addressed the attendees via a telegram. During the afternoon, technical demonstrations took place at the Kjeller Data Processing Center. The purpose of these demonstrations was to give the participants a first-hand impression of the NORESS developments and the data processing, and the presentation also focused on the capabilities of the new NORESS array. The complete program for the opening ceremonies was as follows:

Opening Ceremonies  
Cooperative United States-Norway  
Seismic Research Facility  
NORESS  
3 June 1985

*At the Ministry of Foreign Affairs, Oslo*

0930 Statement by the Minister of Foreign Affairs . . . . . Mr. Sverre Stray

Statement by the United States of America  
Ambassador to Norway . . . . . Mr. Robert D. Stuart

Statement by the Director, Royal Norwegian Council  
for Scientific and Industrial Research . . . . . Dr. Inge Johansen

Statement by the United States of America Ambassador  
to the Conference on Disarmament . . . . . Mr. Donald S. Lowitz

Statement by the Assistant Secretary of Defense  
(Atomic Energy) . . . . . Dr. Richard L. Wagner

Statement by the Assistant Secretary of Energy  
(Defense Programs) . . . . . Mr. William W. Hoover

1200 Luncheon Hosted by the Norwegian Ministry of Foreign Affairs

1400 Travel to the NORESS Data Processing Center at Kjeller

*At the NORESS Facility, Kjeller*

1500 Welcome by NORESS Project Manager . . . . . Dr. Frode Ringdal

Opening Ceremony

Tour of Data Analysis Center

Demonstration of Array Equipment

Return to Oslo

*At the Embassy of the United States of America*

1800 Reception Hosted by United States Delegation



5. Problems or areas of concern

None

6. Anticipated deviation in planned effort

None

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Justification	
By	
Distribution /	
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7. Fiscal status

(a) Amount currently provided for the contract	\$ 825.301
(b) Expenditures and commitments to date:	\$ 644.217
(c) Estimated funds required to complete the work:	\$ 181.084,
(d) Estimated date of completion of work:	30 November 1985

Sincerely,



Frode Ringdal  
Project Manager